has not stopped here. In chemistry, when a discovery has been made of the constitution of a compound body, by analysing it into its constituent elements, the efforts of the chemist are naturally turned to the converse process of proving the same proposition by synthesis, or by combining the single elements and showing that they will produce the compound. This proof has not been wanting in the present case, for Helmholtz has succeeded in combining simple sounds together in such a way as to produce imitations not only of vocal sounds, but of many other peculiar qualities of tone; not perfectly, from the extreme difficulty of imitating exactly all the minute shades of difference that enter into the combination, but still with enough success to demonstrate the general argument.

We have given especial prominence to Helmholtz's discoveries on the nature of musical sounds, because this is in reality the great feature of his work, by which it first acquired its fame, and by which his name will hereafter be honoured. But the physical part of the book contains much beside this that is important and interesting. His explanations on the general phenomena of acoustics are most lucid, and often very original; and his descriptions of the mechanism and action of the organs of hearing, coming from one of the highest authorities in physiology, are exceedingly instructive and valuable.

In Part II. the author enters into an investigation of what are called *beats*—a subject which has been heretofore very obscure—and also of other acoustical phenomena called "combination tones," which, though known since the time of Tartini, have not been thoroughly understood till Helmholtz gave their explanation. Into these matters we have not, however, space to follow the author: those who are interested in them can refer to the book for themselves.

Before we leave the physical part of the work it will be only just to testify to the excellence of the translation. Mr. Ellis is so well known as a philologist and a man of science, that his competence to deal with the work in a literary and scientific point of view requires no comment, and English readers may be satisfied that in this translation they have the original faithfully put before them. His work has evidently been a labour of love, and he deserves the highest credit for the trouble he has taken over it.

At the same time all men are fallible, and when a great authority condescends to do a work that could hardly be expected from him, we must not be unprepared for some little waywardness on his part, and there are a few things which we would rather have seen otherwise done. The title of the book is unfortunate; for, although no doubt "The Sensations of Tone" is a correct translation of "Tonempfindungen," yet to many English ears it will, we fear, sound strange and unintelligible from the fact that we are hardly accustomed in our language to understand the word "tone" in the sense here intended. The English title certainly does not give to the English reader anything like the same idea as the original title, "Die Lehre von den Tonempfindungen," does to an educated German. The strict rendering of a German phrase does not always correctly represent the original; for example, in speaking of the clever little tract of Hauslick, "Ueber das Musickalisch Schöne," Mr. Ellis translates it, "On the musically beautiful," whereas, as every reader of the tract well knows, the more appropriate expression in English would be "On the beautiful in music."

But the chief fault we have to find in the translation is the rendering of a term which of all others is the most important in the whole work, and in which the translator has, we conceive, taken a liberty not altogether justifiable. Helmholtz, in describing the compound nature of musical sounds, has called all the sounds above the fundamental one by the name of "obertöne," a word exceedingly appropriate, useful, and expressive, inasmuch as it at once defines and includes all these sounds in one appellation. Prof. Tyndall, in his *résumé* of Helmholtz's discoveries, has most naturally and with great propriety translated this term by the word "overtones." It exactly expresses the German in the simplest way, and it is as perfectly admissible into English as "overcoat" or "overseer."

Unluckily, Mr. Ellis is either too proud to adopt this word or has taken otherwise a dislike to it; for, on the ground that he does not consider it good English, he substitutes for it the expression "upper partial tones." This is not only clumsy and roundabout, but it is imperfect and wrong, inasmuch as it does not include, as the original expression does, the *whole* of the sounds above the fundamental, and gives no means of distinguishing higher overtones from the lower ones. As these overtones play such an exceedingly important part in Helmholtz's work, we cannot but consider, with all respect to Mr. Ellis, this rendering a blot on the translation which we very much regret.

We must reserve our notice of the musical portion of Helmholtz's work till a future opportunity.

OUR BOOK SHELF

Guide to the Geology of London and the Neighbourhood (Geological Survey of England and Wales). By William Whitaker, B.A., F.G.S. (London: Messrs. Longmans and Co., 1875.)

IT is a matter of great satisfaction to geologists that the Geological Survey are again giving to the public some of the accumulated stores of information of which they are necessarily possessed, by resuming the series of large and complete memoirs which had been in abeyance for many years before the publication of "Whitaker's Geology of the London Basin," Part I., in 1872—a series now so well continued by the works of Judd and Topley. These, however, are comparatively expensive, and enter into minute details, so that although the whole of the information contained in the small book under notice has already been given at greater length in Mr. Whitaker's work mentioned above, or will be in a similar promised publication on the "Drifts of the London Basin," it will be of great use to a large number of persons who would not care for a more detailed description. A special Geological Map of London and its Environs, with all the Drift beds indicated, has lately been published, and for the last two years the Geological Model of London on a six-inch scale has been the admiration of all visitors to the Jermyn Street Museum: the pamphlet now before us is designed as a handbook to these. It commences with a description of the construction of the model, a matter of no small difficulty, considering the accuracy of the representation. The description of the various formations which enter into the London area, with their resulting features and scenery, though necessarily short, contains the cream of all the known facts, and what is better still, the reasons for all the not self-obvious determinations of the age and

relations of the beds. Another most valuable portion is the series of tables of localities where the different formations may now be studied, showing no less than 154 places worthy of a geological visit within twenty miles of London. With regard to the general structure of the district, Mr. Whitaker is careful to refute the idea that the Tertiary beds were deposited in an eroded hollow of the chalk, as is often supposed; unfortunately, however, his section gives them rather the appearance of being so. We should also notice that although, on the evidence of fragments of Ammonites and Belemnites, he prefers to refer the red beds of the Kentish Town section to the Lower Greensand, none of this formation is represented in the section as lying beneath this part of London.

This convenient little publication, so full of valuable and condensed information, for so small a sum, will be of such great use to the members of the numerous field clubs, that we fear it will soon be out of print. What are 500 copies among so many who would wish to have it?

Snioland; or, Iceland, its Jökulls and Fjalls. By William Lord Watts. (London: Longmans and Co., 1875.)

IN a recent number (vol. xii. p. 333) we published a letter from Mr. Watts announcing the important fact that he had succeeded in crossing the Vatna Jökull. So far as is known, this is the first time that this jökull (which means "glacier," and is probably cognate with the latter part of our word ic-*icle*) has been crossed, and the fact is creditable to Mr. Watts's determination and perseverance. The little book before us contains a narrative of an unsuccessful attempt to accomplish the same object, made by Mr. Watts in the summer of 1874. We regret to have to say that the narrative is a disappointing one. It is in the form of a rough diary, which seems to have been sent to the press in its crude form and published with little or no revision. A large portion of the book is occupied with a statement of the many difficulties, petty and serious, which Mr. Watts and his party encountered in the journey from Reykjavik, by the Geysers, Hekla, and the Myrdals Jökull to the Vatna Jökull, and there is really very little information about the region through which he passed. The entire narrative is extremely vague and unsatisfactory, and if Mr. Watts has any literary faculty, he certainly does not show it here; the reading of his narrative is a heavy task. Mr. Watts ought to know a great deal about the region with which this narrative is concerned, and especially about the jökulls in the south of Iceland, and we would advise him to put this information into a systematic form, make but little reference to the difficulties he encountered, obtain a few photographs on a much larger scale than the insignificant things which appear in the present work, and we have no doubt he would make a substantial contribution to our knowledge of Iceland. The party succeeded in getting only about half across the Vatna Jökull, when, from want of the necessary means to go further, they were compelled to turn back, after Mr. Watts had rather unnecessarily and sensationally planted the union jack at his furthest point. Mr. Watts's carelessness, to put it mildly, extends even to his use of language. The use of "laid" for "lay" might possibly be justified by eminent precedents; "peninsular of rock" may be a misprint, but "pulverent" is unjustifiable, and "molusc" is shocking.

Perhaps the most tangible piece of information conveyed by Mr. Watts is contained in the following paragraph:—

"To sum up, this hitherto untrodden Vatna Jökull is a mountainous tract, surmounted by a rolling plateau, containing numerous volcanoes, one or more of which, upon the north, appear to be in a state of pretty constant activity, while numerous others in all probability are paroxysmal, most likely exhibiting all the phenomena characteristic of (if I may be allowed the term) *bottled up volcanoes*. This tract, together with the Odatha-hraun, and the centre of Iceland with its numerous mountains, is a new volume of Nature, the first leaf of which has only just been cut, but whose secluded fastnesses will amply repay investigation."

In an appendix Mr. Watts gives some information as to equipment, which intending travellers in Iceland will find useful. The map at the end is on too small a scale to be of much use.

The main object of Mr. Watts's narrative is to attract attention to Iceland and induce travellers to co-operate in its exploration. We hope the work will serve this laudable object, as there is no doubt Iceland presents a handy and fertile field for explorers. Mr. Watts himself deserves great credit for what he has already achieved; we hope he will continue his work, and in a future publication add something of permanent value to our knowledge of the interesting island.

Report on the Neilgherry Loranthaceous Parasitical Plants destructive to Exotic Forest and Fruit Trees. By George Bidie, M.B., Madras. (Printed by E. Keys, at the Government Press, 1874.)

SURGEON-MAJOR BIDIE has in this volume presented to the Indian Government a report on the parasitical plants which prove destructive to forest and garden trees on the Neilgherries, and on the best mode of remedying the evil. The whole of these destructive parasites belong to one natural order, Loranthaceæ, represented in this country by a single species, the Mistletoe, and to two genera, *Loranthus* and *Viscum*. The fruit of the Loranthaceæ is characterised by the envelopment of the seed in a layer of a viscid substance, described by Dr. Bidie as intermediate in character between resin and india-rubber. Outside this viscid layer is a pulpy body which serves as food for birds and squirrels. After devouring this the seed is rejected, or, in the case of squirrels, passes uninjured through the body, and then adheres to the bark of any tree on which it may be cast. If the immediate conditions are unfavourable, the seed will be preserved in a state capable of germination for a very considerable time beneath its viscid covering. With regard to the mode of germination, Dr. Bidie has nothing to add to the information already furnished by Mr. Griffith and Dr. Hooker. With reference to the mode of attachment between the parasite and the host, the author states that although very firmly attached, there is no actual interlacing of the tissues; and that in some instances, after maceration in water for a few days, the parasite could be separated from the host without much difficulty. It is noteworthy that native Indian trees and shrubs do not appear to suffer nearly so much from the attacks of the Loranthaceæ as introduced, especially Australian, species. One foreigner, however, which appeared quite exempt from their ravages, was the "blue gum," the *Eucalyptus globulus*, which has already so many other useful qualities placed to its credit. Dr. Bidie asserts that the Loranthaceæ derive their nutriment not from the descending elaborated, but from the crude ascending sap of the host; hence their need for green foliage containing chlorophyll and possessing stomata, in which other parasites are deficient. The volume is embellished by fifteen large lithographs representing the different species, and illustrating the structure of the fruit and the mode of parasitism of the order.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

Personal Equation in the Tabulation of Thermograms, &c.

MR. PLUMMER, in his letter (NATURE, vol. xii. p. 395), has missed the point of the review of the work of the Meteorological